

1. First time diagnosis of inflammatory bowel disease (IBD) between 1964 and 2014

2. Diagnosed aged <18 yrs

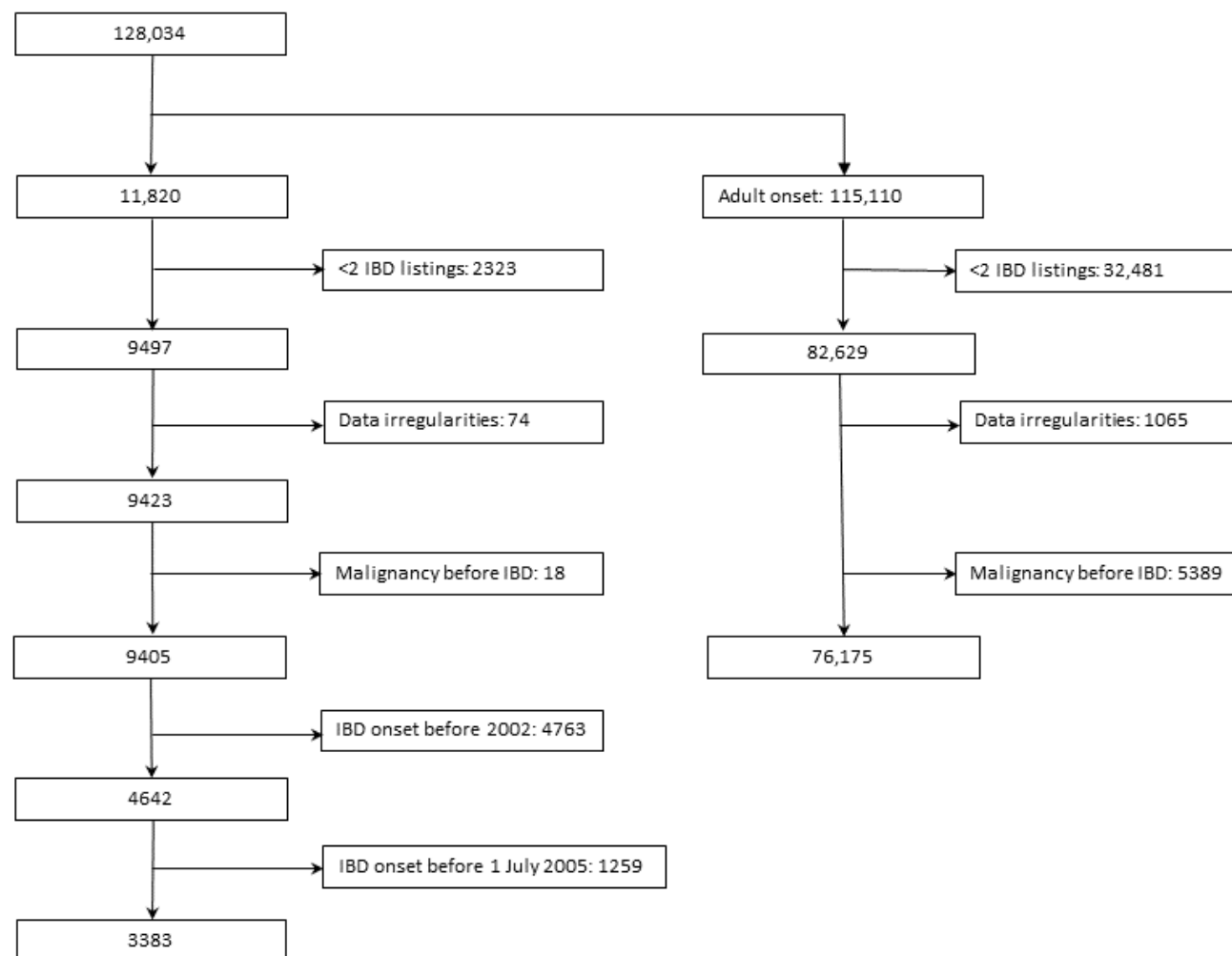
3. Diagnosed at least twice

4. Regular cases

5. Eligible patients

6. IBD-onset 2002-2014

7. IBD-onset 1 July 2005-2014



**Supplementary Figure S1.** Flow chart of register-identified childhood-onset as well as adult-onset IBD patients.

**Supplementary Table S10a.** Hazard ratio<sup>†</sup> of first ever event of a cancer type in the cohort of patients with IBD onset <18 years of age compared with matched general population reference individuals by calendar period of first identification of IBD (vs all years), stratified by age at time of cancer diagnosis (first year of follow-up included).

	1964-2001	2002-2014	1964-2014
	n/pc, HR(95%CI) #	n/pc, HR(95%CI)	n/pc, HR(95%CI)
<b>Cancer in All age groups</b>			
All cancers*	442/1182, 2.2 (2.0-2.4)	55/305, 2.7 (2.2-3.6)	497/1487, 2.2 (2.0-2.5)
Gastrointestinal cancer	186/1203, 17.1 (13.5-21.6)	16/306, 53.4 (17.8-229.9)	202/1509, 18.8 (14.4-22.7)
Colorectal cancer	113/1109, 18.5 (13.8-24.9)	9/304, 91.3 (17.1-168)	122/1413, 19.5 (14.7-26.2)
Small bowel cancer	5/1211, 12.8 (3.4-51.8)	no events ##	5/1518, 12.8 (3.4-51.8)
Liver cancer	61/1211, 124 (55-354)	5/306, Inf (0-Inf)	66/1517, 134 (59.6-382)
Hematologic cancer	23/1211, 2.2 (1.4-3.4)	5/306, 1.9 (0.7-4.6)	28/1517, 2.2 (1.4-3.2)
Lymphoid malignancy	19/1211, 2.8 (1.6-4.5)	5/306, 2.6 (0.9-6.5)	24/1517, 2.7 (1.7-4.2)
Myeloid malignancy	4/1212, 1.1 (0.3-2.8)	0/306, 0 (0-3.2)	4/1518, 0.9 (0.3-2.3)
Melanoma skin cancer	29/1210, 1.4 (0.9-2.2)	8/306, 10 (3.7-27.2)	37/1516, 1.7 (1.2-2.4)
Non-melanoma skin ca	25/1211, 5.9 (3.6-9.5)	no events	25/1517, 5.9 (3.6-9.5)
Breast cancer	19/1210, 0.8 (0.5-1.2)	0/306, 0 (0-16.1)	19/1517, 0.8 (0.5-1.2)
Genital, female	106/548, 1.1 (0.9-1.3)	20/136, 1.6 (1.1-2.6)	126/684, 1.1 (0.9-1.3)
Genital, male	18/651, 1.4 (0.9-2.3)	1/170, 0.6 (0.0-2.9)	19/821, 1.3 (0.8-2.1)
Eye, brain, CNS	12/1211, 1.5 (0.8-2.6)	1/306, 1.1 (0.1-5.9)	13/1517, 1.4 (0.8-2.5)
Thyroid, endocrinological	11/1211, 1.4 (0.7-2.4)	0/306, 0 (0-3.1)	11/1518, 1.3 (0.6-2.2)
Cancers not listed above	35/1211, 2.9 (1.9-4.1)	5/306, 4.1 (1.3-11.2)	40/1517, 3.3 (2.1-4.2)
<b>Cancer before 18th birthday</b>			
All cancers*	11/205, 2.5 (1.2-4.7)	9/144, 3.3 (1.3-6.0)	20/349, 2.7 (1.6-4.4)
Gastrointestinal cancer	6/205, 30 (6.9-205)	2/144, 19.8 (1.9-424)	8/349, 26.5 (7.7-121)
Colorectal cancer	4/202, Inf (0-Inf)	1/144, Inf (0-Inf)	5/346, Inf (0-Inf)
Small bowel cancer	1/205, Inf (0-Inf)	no events	1/349, Inf (0-Inf)
Liver cancer	no events	1/144, Inf (0-Inf)	1/349, Inf (0-Inf)
Hematologic cancer	4/205, 4.4 (1.1-11.8)	5/144, 5.5 (1.7-16)	9/349, 4.7 (2.2-10.1)
Lymphoid malignancy	4/205, 5.7 (1.5-18.8)	5/144, 6.2 (1.9-18.6)	9/349, 6.6 (2.5-13.4)
Myeloid malignancy	0/205, 0 (0-8.9)	0/144, 0 (0-Inf)	0/349, 0 (0-6.1)
Melanoma skin cancer	0/205, 0 (0-16)	no events	0/349, 0 (0-15.7)
Non-melanoma skin ca	0/205, 0 (0-58.3)	no events	0/349, 0 (0-Inf)
Breast cancer	no events	no events	no events
Genital, female	1/91, 1.4 (0.1-7.9)	no events	1/155, 1.4 (0.1-7.9)
Genital, male	0/114, 0 (0-8.9)	0/81, 0.1 (0-16.2)	0/195, 0 (0-4.6)
Eye, brain, CNS	0/205, 0 (0-2.7)	0/144, 0 (0-3.1)	0/349, 0 (0-1.4)
Thyroid, endocrinological	0/205, 0 (0-16)	0/144, 0 (0-6.1)	0/349, 0 (0-3.7)
Cancers not listed above	0/205, 0 (0-2.7)	2/144, 2.9 (0.4-12)	2/349, 1.3 (0.2-4.7)
<b>Cancer after 18th birthday</b>			
All cancers*	431/977, 2.2 (2.0-2.4)	46/161, 2.7 (1.9-3.6)	477/1138, 2.2 (2.0-2.4)
Gastrointestinal cancer	180/997, 16.7 (13.2-21.3)	14/162, 69.8 (19.5-444)	194/1159, 17.7 (14.1-22.4)
Colorectal cancer	109/906, 17.7 (13.2-23.9)	8/160, 80.7 (14.8-1498)	117/1066, 18.7 (14.4-25.1)
Small bowel cancer	4/975, 10.8 (2.6-45.6)	no events	4/1136, 10.8 (2.6-45.6)
Liver cancer	60/974, 125 (55.4-357)	4/161, Inf (0-Inf)	64/1135, 133 (59.1-379)
Hematologic cancer	19/974, 2.1 (1.3-3.4)	0/161, 0 (0-1.2)	19/1135, 1.8 (1.1-2.8)
Lymphoid malignancy	15/974, 2.5 (1.4-4.3)	0/161, 0 (0-1.9)	15/1135, 2.1 (1.2-3.6)
Myeloid malignancy	4/975, 1.3 (0.4-3.3)	0/161, 0 (0-3.7)	4/1136, 1.1 (0.3-2.7)
Melanoma skin cancer	29/973, 1.5 (1.1-2.1)	8/161, 10.0 (3.7-27.1)	37/1134, 1.8 (1.3-2.5)
Non-melanoma skin ca	25/974, 6.3 (3.8-10.2)	no events	25/1135, 6.3 (3.8-10.2)
Breast cancer	18/973, 0.8 (0.5-1.2)	0/161, 0 (0-16.4)	18/1135, 0.8 (0.5-1.2)
Genital, female	101/438, 1 (0.9-1.3)	20/72, 1.7 (1-2.6)	121/510, 1.1 (0.9-1.3)
Genital, male	17/525, 1.4 (0.8-2.3)	1/89, 0.7 (0.0-3.4)	18/613, 1.3 (0.8-2.1)
Eye, brain, CNS	11/974, 1.6 (0.8-2.8)	1/161, 5.5 (0.2-52.5)	12/1135, 1.7 (0.9-2.9)
Thyroid, endocrinological	11/974, 1.4 (0.7-2.6)	0/161, 0 (0-8.9)	11/1135, 1.4 (0.7-2.5)
Cancers not listed above	35/974, 3.2 (2.2-4.6)	3/161, 6.6 (1.2-24.3)	38/1135, 3.3 (2.3-4.7)

†Adjusted for matching variables (i.e. sex, age at diagnosis, calendar year at diagnosis, and county). # N cases of cancer in IBD patients/person *centuries* of follow-up in IBD patients (hazard ratio (95% confidence Interval). \* Hazard ratios for specific cancers are calculated as the risk of a first ever cancer of that cancer type, i.e. an individual was at risk of first ever liver cancer until the first diagnosis of liver cancer, regardless of any other cancers that may have been diagnosed before the liver cancer during follow-up. Anal cancer and appendix cancer were not counted as a colorectal cancer, but were included in the category “Gastrointestinal cancer”.  
 ### “No events” means that there were no cases among IBD patients or matched reference individuals

**Supplementary Table S10b.** Hazard ratio<sup>†</sup> of first ever event of a cancer type in the cohort of patients with **ulcerative colitis (UC)** onset <18 years of age as compared with matched general population reference individuals by calendar period of first identification of UC (vs. all years), stratified by age at time of cancer diagnosis (first year of follow-up *included*).

	1964-2001	2002-2014	1964-2014
	n/pc, HR(95%CI) #	n/pc, HR(95%CI)	n/pc, HR(95%CI)
<b>Cancer in All age groups</b>			
All cancers*	271/635, 2.6 (2.3-3.0)	28/142, 2.8 (1.8-4.2)	299/776, 2.6 (2.3-3.0)
Gastrointestinal cancer	150/645, 25.5 (19.1-34.5)	5/143, Inf (20.9-Inf)	155/788, 26.3 (19.8-35.6)
Colorectal cancer	94/574, 32.7 (22.6-48.3)	2/141, Inf (0-Inf)	96/715, 33.3 (23.1-49.1)
Small bowel cancer	4/652, 20.7 (4.4-149)	no events	4/795, 20.7 (4.4-150)
Liver cancer	51/652, 262 (81.6-1603)	2/143, Inf (6.03-Inf)	53/794, 273 (84.9-1665)
Hematologic cancer	12/652, 2.3 (1.2-4.1)	1/142, 0.8 (0-4.2)	13/794, 2.2 (1.1-3.5)
Lymphoid malignancy	9/652, 3.3 (1.4-6.1)	1/142, 1.1 (0.1-5.9)	10/794, 2.6 (1.2-5)
Myeloid malignancy	3/652, 1.3 (0.3-3.7)	0/143, 0 (0-8.8)	3/795, 1.2 (0.3-3.2)
Melanoma skin cancer	11/652, 1.1 (0.6-1.9)	4/142, 10.3 (2.4-43.6)	15/794, 1.4 (0.8-2.4)
Non-melanoma skin ca	8/652, 3.9 (1.6-8.5)	no events	8/795, 3.9 (1.6-8.5)
Breast cancer	10/652, 0.9 (0.4-1.6)	0/143, 0 (0-58.3)	10/794, 0.9 (0.4-1.6)
Genital, female	53/296, 1 (0.8-1.3)	14/65, 2.3 (1.2-3.9)	67/361, 1.1 (0.9-1.4)
Genital, male	9/350, 1.5 (0.7-2.8)	0/77, 0 (0-2.7)	9/427, 1.3 (0.6-2.5)
Eye, brain, CNS	8/652, 1.8 (0.8-3.7)	0/143, 0 (0-4.7)	8/794, 1.6 (0.7-3.3)
Thyroid, endocrinological	5/652, 1.3 (0.5-3.1)	0/143, 0 (0-6.1)	5/795, 1.2 (0.4-2.8)
Cancers not listed above	18/652, 3.1 (1.8-5.2)	4/142, 10 (2.4-42.2)	22/795, 3.6 (2.2-5.7)
<b>Cancer before 18th birthday</b>			
All cancers*	7/120, 3.3 (1.3-7.4)	2/65, 1.5 (0.2-5.5)	9/185, 2.6 (1.2-5.2)
Gastrointestinal cancer	5/120, Inf (0-Inf)	no events	5/185, Inf (0-Inf)
Colorectal cancer	4/118, Inf (0-Inf)	no events	4/183, Inf (0-Inf)
Small bowel cancer	1/121, Inf (0-Inf)	no events	1/185, Inf (0-Inf)
Liver cancer	no events	no events	no events
Hematologic cancer	1/120, 2.5 (0.1-16.8)	1/65, 2.2 (0.1-12.4)	2/185, 2.2 (0.3-8.6)
Lymphoid malignancy	1/120, 3.3 (0.2-25.8)	1/65, 2.5 (0.1-16.8)	2/185, 2.8 (0.4-11.8)
Myeloid malignancy	0/121, 0 (0-Inf)	0/65, 0 (0-Inf)	0/185, 0 (0-Inf)
Melanoma skin cancer	0/121, 0 (0-58.3)	no events	0/185, 0 (0-57.8)
Non-melanoma skin ca	0/121, 0 (0-58.3)	no events	0/185, 0 (0-58.3)
Breast cancer	no events	no events	no events
Genital, female	1/55, 5.5 (0.2-52.2)	no events	1/86, 5 (0.2-52.2)
Genital, male	0/65, 0 (0-Inf)	0/34, 0 (0-58.3)	0/100, 0 (0-15.9)
Eye, brain, CNS	0/121, 0 (0-3.7)	0/65, 0 (0-8.7)	0/185, 0 (0-2.4)
Thyroid, endocrinological	0/121, 0 (0-Inf)	0/65, 0 (0-16)	0/185, 0 (0-9)
Cancers not listed above	0/121, 0 (0-4.6)	1/65, 5 (0.2-52.3)	1/185, 1.4 (0.1-8)
<b>Cancer after 18th birthday</b>			
All cancers*	264/514, 2.6 (2.3-3.3)	26/77, 3.3 (1.9-4.5)	290/591, 2.6 (2.3-3.3)
Gastrointestinal cancer	145/524, 24.5 (18.4-33.2)	5/78, Inf (21-Inf)	150/602, 25.4 (19-34.3)
Colorectal cancer	90/456, 31.3 (21.6-46.3)	2/76, Inf (0-Inf)	92/532, 31.9 (22-47.1)
Small bowel cancer	3/506, 18.2 (3-138)	no events	3/583, 18.2 (3-138)
Liver cancer	50/505, 270 (83.9-1652)	2/77, Inf (6.1-Inf)	52/583, 280 (87.2-1710)
Hematologic cancer	11/506, 2.5 (1.2-4.6)	0/77, 0 (0-3.2)	11/583, 2.1 (1.1-3.9)
Lymphoid malignancy	8/506, 3.3 (1.4-7)	0/77, 0 (0-4.8)	8/583, 2.7 (1.2-5.7)
Myeloid malignancy	3/506, 1.5 (0.4-4.2)	0/77, 0 (0-15.8)	3/583, 1.3 (0.3-3.8)
Melanoma skin cancer	11/505, 1.2 (0.6-2.1)	4/77, 10.1 (2.4-42.5)	15/583, 1.5 (0.8-2.5)

	1964-2001	2002-2014	1964-2014
	n/pc, HR(95%CI) #	n/pc, HR(95%CI)	n/pc, HR(95%CI)
Non-melanoma skin ca	8/506, 4.6 (1.9-10)	no events	8/583, 4.6 (1.9-10)
Breast cancer	9/505, 0.8 (0.4-1.6)	0/77, 0 (0-56.7)	9/583, 0.8 (0.4-1.5)
Genital, female	49/225, 1 (0.7-1.3)	14/34, 2.2 (1.2-3.9)	63/259, 1.1 (0.9-1.5)
Genital, male	8/275, 1.4 (0.6-2.7)	0/42, 0 (0-3.1)	8/317, 1.2 (0.6-2.4)
Eye, brain, CNS	8/505, 2.3 (1-4.7)	0/77, 0.1 (0-17.7)	8/583, 2.2 (0.9-4.4)
Thyroid, endocrinological	5/506, 1.5 (0.5-3.4)	0/77, 0 (0-16.2)	5/583, 1.4 (0.5-3.2)
Cancers not listed above	18/506, 3.7 (2.1-6.1)	3/77, 15.1 (2.5-114)	21/583, 4.1 (2.4-6.6)

†Adjusted for matching variables (i.e. sex, age at diagnosis, calendar year at diagnosis, and county). # N cases of cancer in IBD patients/person *centuries* of follow-up in IBD patients (hazard ratio (95% confidence interval)). \* Hazard ratios for specific cancers are calculated as the risk of a first ever cancer of that cancer type, i.e. an individual was at risk of first ever liver cancer until the first diagnosis of liver cancer, regardless of any other cancers that may have been diagnosed before the liver cancer during follow-up. Anal cancer and appendix cancer were not counted as a colorectal cancer, but were included in the category "Gastrointestinal cancer".

## "No events" means that there were no cases among IBD patients or matched reference individuals

**Supplementary Table S10c.** Hazard ratio<sup>†</sup> of first ever event of a cancer type in the cohort of patients with **Crohn's disease (CD)** onset <18 years of age as compared with matched general population reference individuals by calendar period of first identification of CD (vs. all years), stratified by age at time of cancer diagnosis, first year of follow-up *included*.

	1964-2001	2002-2014	1964-2014
	n/pc, HR(95%CI) #	n/pc, HR(95%CI)	n/pc, HR(95%CI)
<b>Cancer in All age groups</b>			
All cancers*	134/444, 1.7 (1.4-2.0)	19/132, 2.4 (1.4-3.9)	153/576, 1.7 (1.4-2.1)
Gastrointestinal cancer	28/453, 6.9 (4.2-11.1)	5/132, 50.8 (8.2-972)	33/585, 7.9 (5.5-12.4)
Colorectal cancer	14/437, 5.5 (2.6-9.2)	3/132, 29.9 (3.8-604)	17/569, 5.8 (3.2-10.4)
Small bowel cancer	1/454, 9.7 (0.4-244)	no events	1/586, 9.7 (0.4-244)
Liver cancer	7/454, 24 (6.65-111)	1/132, Inf (0-Inf)	8/586, 27 (7.8-123)
Hematologic cancer	8/454, 1.9 (0.8-3.8)	4/132, 3.6 (1-10.6)	12/586, 2.2 (1.2-4.1)
Lymphoid malignancy	8/454, 2.5 (1.1-5.1)	4/132, 5.7 (1.5-18.9)	12/586, 3.3 (1.5-5.7)
Myeloid malignancy	0/454, 0 (0-1.7)	0/132, 0 (0-6.7)	0/586, 0 (0-1.3)
Melanoma skin cancer	14/453, 1.7 (0.9-3)	3/132, 10.1 (1.9-54.8)	17/586, 2.2 (1.2-3.3)
Non-melanoma skin ca	15/454, 8.4 (4.2-16.6)	no events	15/586, 8.4 (4.2-16.6)
Breast cancer	7/454, 0.6 (0.3-1.2)	no events	7/586, 0.6 (0.3-1.2)
Genital, female	40/200, 1 (0.7-1.4)	4/57, 0.8 (0.2-2)	44/256, 1 (0.7-1.4)
Genital, male	7/249, 1.4 (0.6-2.8)	1/75, 1.4 (0.1-7.6)	8/325, 1.4 (0.6-2.7)
Eye, brain, CNS	3/454, 1 (0.2-2.9)	1/132, 3.3 (0.2-25.9)	4/586, 1.2 (0.4-3.1)
Thyroid, endocrinological	6/454, 1.9 (0.7-4.3)	0/132, 0 (0-8.69)	6/586, 1.8 (0.7-3.9)
Cancers not listed above	14/454, 2.5 (1.3-4.4)	1/132, 2.6 (0.1-17.2)	15/586, 2.5 (1.4-4.3)

<b>Cancer before 18th birthday</b>			
All cancers*	4/67, 3.1 (0.9-8.6)	5/63, 5.6 (1.7-16.1)	9/130, 4.1 (1.8-8.6)
Gastrointestinal cancer	1/67, 9.7 (0.4-246)	no events	1/130, 9.7 (0.4-246)
Colorectal cancer	no events	no events	no events
Small bowel cancer	no events	no events	no events
Liver cancer	no events	no events	no events
Hematologic cancer	3/67, 7.4 (1.5-33.8)	4/63, 39.4 (5.8-771)	7/130, 13.9 (4.4-47)
Lymphoid malignancy	3/67, 15.1 (2.5-114.4)	4/63, 39.4 (5.8-771)	7/130, 23.2 (6.4-107)
Myeloid malignancy	0/67, 0 (0-16)	no events	0/130, 0 (0-16)
Melanoma skin cancer	no events	no events	no events
Non-melanoma skin ca	no events	no events	no events
Breast cancer	no events	no events	no events
Genital, female	0/28, 0 (0-6.1)	no events	0/54, 0 (0-6)
Genital, male	0/39, 0 (0-57.1)	0/37, 0 (0-52.7)	0/76, 0.3 (0-17)
Eye, brain, CNS	0/67, 0 (0-57.5)	0/64, 0 (0-8.8)	0/130, 0 (0-6.1)
Thyroid, endocrinological	no events	0/64, 0 (0-15.8)	0/130, 0 (0-15.6)
Cancers not listed above	0/67, 0 (0-Inf)	1/64, 5.9 (0.3-65.7)	1/130, 2.6 (0.1-17.7)

<b>Cancer after 18th birthday</b>			
-----------------------------------	--	--	--

	1964-2001	2002-2014	1964-2014
	n/pc, HR(95%CI) #	n/pc, HR(95%CI)	n/pc, HR(95%CI)
All cancers*	130/378, 1.6 (1.4-2)	14/68, 2.0 (1.1-3.5)	144/446, 1.7 (1.4-2.0)
Gastrointestinal cancer	27/386, 6.8 (4.1-11)	5/68, 50.8 (8.2-972)	32/454, 7.8 (4.9-12.4)
Colorectal cancer	14/370, 5 (2.6-9.3)	3/68, 30 (3.8-606)	17/438, 5.8 (3.2-10.4)
Small bowel cancer	1/383, 10.1 (0.4-255)	no events	1/451, 10.1 (0.4-255)
Liver cancer	7/383, 23.4 (6.5-109)	1/68, Inf (0-Inf)	8/451, 26.5 (7.7-121)
Hematologic cancer	5/383, 1.3 (0.5-3)	0/68, 0 (0-2.1)	5/451, 1.1 (0.4-2.4)
Lymphoid malignancy	5/383, 1.7 (0.6-3.9)	0/68, 0 (0-3.7)	5/451, 1 (0.5-3.2)
Myeloid malignancy	0/383, 0 (0-2.4)	0/68, 0 (0-6.1)	0/451, 0 (0-1.6)
Melanoma skin cancer	14/382, 1.8 (1-3)	3/68, 10.2 (1.9-55.2)	17/451, 2.1 (1.2-3.4)
Non-melanoma skin ca	15/382, 8.5 (4.2-16.9)	no events	15/451, 8.5 (4.2-16.9)
Breast cancer	7/383, 0.6 (0.3-1.2)	no events	7/451, 0.6 (0.3-1.2)
Genital, female	39/170, 1 (0.7-1.4)	4/30, 0.9 (0.3-2.1)	43/200, 1 (0.7-1.4)
Genital, male	7/208, 1.4 (0.6-2.9)	1/38, 1.8 (0.1-10.6)	8/246, 1.4 (0.6-2.8)
Eye, brain, CNS	3/383, 1 (0.3-2.9)	1/68, Inf (0-Inf)	4/451, 1.4 (0.4-3.5)
Thyroid, endocrinological	6/382, 2 (0.7-4.4)	0/68, 0 (0-54.2)	6/451, 1.9 (0.7-4.2)
Cancers not listed above	14/382, 2.6 (1.4-4.6)	0/68, 0 (0-16.2)	14/451, 2.5 (1.4-4.4)

†Adjusted for matching variables (i.e. sex, age at diagnosis, calendar year at diagnosis, and county). # N cases of cancer in IBD patients/person centuries of follow-up in IBD patients (hazard ratio (95% confidence Interval)). \* Hazard ratios for specific cancers are calculated as the risk of a first ever cancer of that cancer type, i.e. an individual was at risk of first ever liver cancer until the first diagnosis of liver cancer, regardless of any other cancers that may have been diagnosed before the liver cancer during follow-up. Anal cancer and appendix cancer were not counted as a colorectal cancer, but were included in the category "Gastrointestinal cancer".  
 ## "No events" means that there were no cases among IBD patients or matched reference individuals

**Supplementary Table S10d.** Hazard ratio† of first ever event of a cancer type in the cohort of patients with IBD onset <18 years of age as compared with matched general population reference individuals by calendar period of first identification of IBD (vs. all years), stratified by age at time of cancer diagnosis (first year of follow-up EXCLUDED).

	1964-2001	2002-2014	1964-2014
	n/pc, HR(95%CI) #	n/pc, HR(95%CI)	n/pc, HR(95%CI)
<b>Cancer in All age groups</b>			
All cancers*	439/1134, 2.2 (2.0-2.4)	50/260, 2.6 (1.9-3.5)	489/1394, 2.2 (2.0-2.4)
Gastrointestinal cancer	184/1155, 16.9 (13.4-21.4)	15/261, 50 (16.5-216)	199/1416, 17.7 (14.1-22.4)
Colorectal cancer	112/1062, 18.3 (13.7-24.7)	8/259, 81.3 (14.9-1508)	120/1321, 19.2 (14.4-25.8)
Small bowel cancer	4/1164, 10.3 (2.4-43.7)	no events ##	4/1425, 10.3 (2.4-43.7)
Liver cancer	61/1163, 124 (55-354)	5/261, Inf (0-Inf)	66/1424, <b>134 (59.6-382)</b>
Hematologic cancer	22/1163, 2.2 (1.4-3.5)	1/261, 0.4 (0-2.2)	23/1424, 1.9 (1.2-2.9)
Lymphoid malignancy	18/1163, 2.7 (1.6-4.5)	1/261, 0.7 (0-3.3)	19/1424, 2.4 (1.4-3.8)
Myeloid malignancy	4/1164, 1.2 (0.4-2.9)	0/262, 0 (0-3.2)	4/1426, 1 (0.3-2.4)
Melanoma skin cancer	29/1162, 1.4 (0.9-2)	8/261, 11.5 (4.1-32.7)	37/1424, 1.7 (1.2-2.4)
Non-melanoma skin ca	25/1163, 5.9 (3.6-9.5)	no events	25/1425, 5.9 (3.6-9.5)
Breast cancer	19/1163, 0.8 (0.5-1.2)	0/262, 0 (0-16.1)	19/1424, 0.8 (0.5-1.2)
Genital, female	106/526, 1 (0.8-1.3)	20/116, 1.6 (1-2.6)	126/643, 1.1 (0.9-1.3)
Genital, male	18/625, 1.5 (0.9-2.3)	1/145, 0.6 (0-3.1)	19/770, 1.4 (0.8-2.1)
Eye, brain, CNS	12/1163, 1.5 (0.8-2.7)	1/261, 1.2 (0.1-6.8)	13/1425, 1.5 (0.8-2.6)
Thyroid, endocrinological	11/1163, 1.4 (0.7-2.4)	0/262, 0 (0-3.1)	11/1425, 1.3 (0.6-2.2)
Cancers not listed above	35/1163, 2.9 (1.9-4.1)	5/261, 5.5 (1.7-16)	40/1425, 3 (2.1-4.3)
<b>Cancer before 18th birthday</b>			
All cancers*	8/161, 2.3 (1-4.8)	4/103, 1.9 (0.6-5)	12/264, 2.2 (1.1-3.9)
Gastrointestinal cancer	4/162, 20.4 (4.4-147)	1/103, 10.3 (0.4-260)	5/265, 16.7 (4.1-81.6)
Colorectal cancer	3/159, Inf (0-Inf)	no events	3/262, Inf (0-Inf)
Small bowel cancer	no events	no events	no events
Liver cancer	no events	1/103, Inf (0-Inf)	1/265, Inf (0-Inf)
Hematologic cancer	3/161, 6 (1.2-24.4)	1/103, 2 (0.1-12.3)	4/265, 4 (1.1-11.9)
Lymphoid malignancy	3/161, 7.5 (1.5-34.2)	1/103, 2.5 (0.1-16.7)	4/265, 5 (1.3-15.8)
Myeloid malignancy	0/162, 0 (0-57.6)	0/103, 0 (0-Inf)	0/265, 0 (0-16.1)

	1964-2001	2002-2014	1964-2014
	n/pc, HR(95%CI) #	n/pc, HR(95%CI)	n/pc, HR(95%CI)
Melanoma skin cancer	0/162, 0 (0-16)	no events	0/265, 0 (0-15.7)
Non-melanoma skin ca	0/162, 0 (0-52.4)	no events	0/265, 0 (0-51)
Breast cancer	no events	no events	no events
Genital, female	1/72, 2 (0.1-12.4)	no events	1/117, 2 (0.1-12.4)
Genital, male	0/90, 0 (0-16)	0/57, 0 (0-Inf)	0/147, 0 (0-8.9)
Eye, brain, CNS	0/162, 0 (0-3.1)	0/103, 0 (0-3.7)	0/265, 0 (0-1.6)
Thyroid, endocrinological	0/162, 0 (0-16)	0/103, 0 (0-6.1)	0/265, 0 (0-3.8)
Cancers not listed above	0/162, 0 (0-2.7)	2/103, 5.1 (0.7-25.9)	2/265, 1.7 (0.3-6.1)
<b>Cancer after 18th birthday</b>			
All cancers*	431/973, 2.2 (2.0-2.4)	46/157, 2.7 (1.9-3.7)	477/1130, 2.2 (2.0-2.4)
Gastrointestinal cancer	180/993, 16.7 (13.2-21.3)	14/158, 70.7 (19.8-450)	194/1151, 17.7 (14.1-22.4)
Colorectal cancer	109/902, 17.8 (13.2-24)	8/156, 80.7 (14.8-1497)	117/1058, 18.7 (14-25.1)
Small bowel cancer	4/971, 10.9 (2.6-46.2)	no events	4/1128, 10.9 (2.6-46.2)
Liver cancer	60/970, 125 (55.4-358)	4/157, Inf (0-Inf)	64/1127, 133 (59.2-380)
Hematologic cancer	19/970, 2.1 (1.3-3.4)	0/157, 0 (0-1.2)	19/1127, 1.8 (1.1-2.8)
Lymphoid malignancy	15/970, 2.5 (1.4-4.4)	0/157, 0 (0-1.9)	15/1128, 2.1 (1.2-3.6)
Myeloid malignancy	4/971, 1.3 (0.4-3.3)	0/157, 0 (0-3.73)	4/1128, 1.1 (0.3-2.7)
Melanoma skin cancer	29/969, 1.5 (1-2.1)	8/157, 11.5 (4.1-32.8)	37/1126, 1.8 (1.3-2.6)
Non-melanoma skin ca	25/970, 6.3 (3.8-10.2)	no events	25/1127, 6.3 (3.8-10.2)
Breast cancer	18/969, 0.8 (0.5-1.2)	0/157, 0 (0-16)	18/1127, 0.8 (0.5-1.2)
Genital, female	101/436, 1 (0.9-1.3)	20/70, 1.7 (1-2.6)	121/506, 1.1 (0.9-1.3)
Genital, male	17/523, 1.4 (0.8-2.3)	1/87, 0.7 (0-3.4)	18/610, 1.3 (0.8-2.1)
Eye, brain, CNS	11/970, 1.6 (0.8-2.9)	1/157, 5 (0.2-52.6)	12/1127, 1.7 (0.9-3)
Thyroid, endocrinological	11/970, 1.4 (0.7-2.6)	0/157, 0 (0-9)	11/1127, 1.4 (0.7-2.5)
Other	35/970, 3.2 (2.2-4.6)	3/157, 6 (1.2-24.4)	38/1127, 3.3 (2.3-4.7)

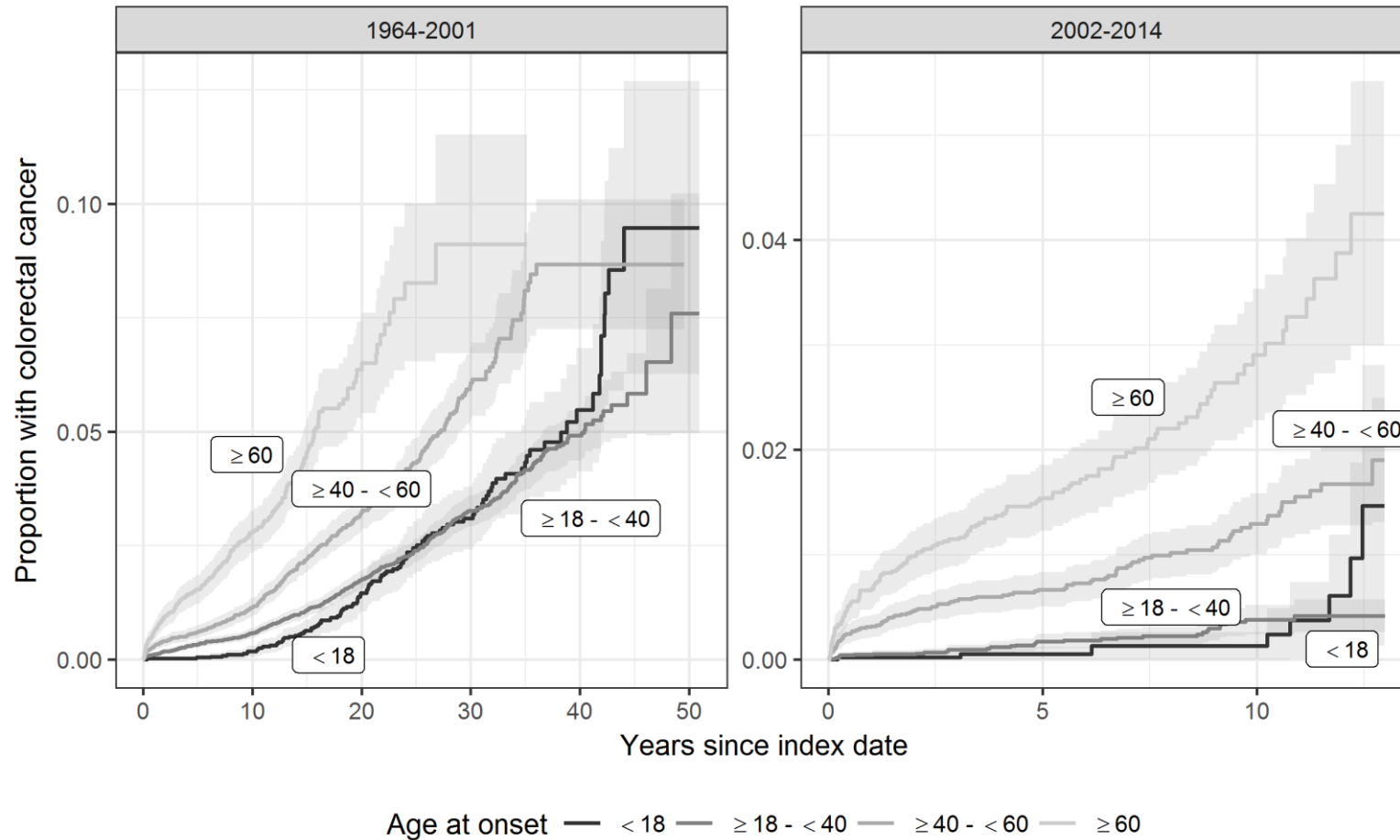
†Adjusted for matching variables (i.e. sex, age at diagnosis, calendar year at diagnosis, and county). # N cases of cancer in IBD patients/person *centuries* of follow-up in IBD patients (hazard ratio (95% confidence Interval)). \* Hazard ratios for specific cancers are calculated as the risk of a first ever cancer of that cancer type, i.e. an individual was at risk of first ever liver cancer until the first diagnosis of liver cancer, regardless of any other cancers that may have been diagnosed before the liver cancer during follow-up. Anal cancer and appendix cancer were not counted as a colorectal cancer, but were included in the category "Gastrointestinal cancer".

## "No events" means that there were no cases among IBD patients or matched reference individuals

**Supplementary Table S10e** Hazard ratio<sup>†</sup> of first ever event of a cancer type in the cohort of patients with inflammatory bowel disease (IBD) onset <18 years of age as compared with matched general population reference individuals by calendar period of first identification of IBD, **restricted to cancers occurring before age 25** (first year of follow-up *included*). The p-value is for a Wald test whether the hazard ratios differ by period.

	1964 - 1989	1990 - 2001	2002 - 2006	2007 - 2014	p-value
	n/pc, HR(95% CI) #	n/pc, HR(95% CI)	n/pc, HR(95% CI)	n/pc, HR(95% CI)	
<25 years	26/263, 1.6 (1.0-2.4)	32/265, 2.3 (1.5-3.3)	32/171, 2.8 (1.9-4.2)	10/117, 2.2 (1.0-4.2)	0.22

†Adjusted for matching variables (i.e. sex, age at diagnosis, calendar year at diagnosis, and county). # N cases of cancer in IBD patients/person *centuries* of follow-up in IBD patients, hazard ratio (95% confidence Interval).



**Supplementary Figure S2.** Kaplan-Meier cumulative incidence curves, comparing childhood-onset inflammatory bowel disease (IBD) with other ages of onset, stratified by calendar year of first IBD diagnosis. Percent of patients at risk with diagnosis of colorectal cancer before different years since index date. The overall test:  $p < 0.001$  (both calendar periods). Comparing each group to the <18 years versus  $\geq 18$ -<40,  $\geq 40$ -<60, and  $\geq 60$  years: P-values for 1964-2001: 0.99, <0.001, <0.001. For 2002-2014: 0.80, <0.001, <0.001.

**Supplementary Table S11** Timing and phenotype of cases of colorectal cancer during the first 20 years of follow-up in 9405 cases of childhood-onset inflammatory bowel disease (IBD) in Sweden (1964-2014).

	<b>Inflammatory bowel disease</b>	<b>ulcerative colitis</b>	<b>Crohn's disease</b>	<b>IBD- Unclassified</b>
	N (%)	n (%)	n (%)	n (%)
Total	61 (100)	41 (100)	15 (100)	5 (100)
Length of follow-up (years)				
≥0 - <1	2 (3)	1 (2)	1 (7)	0 (0)
≥1 - <5	2 (3)	1 (2)	0 (0)	1 (20)
≥5 - <10	8 (13)	4 (10)	4 (27)	0 (0)
≥10 - <20	49 (80)	35 (85)	10 (67)	4 (80)
Primary sclerosing cholangitis	8 (13)	6 (15)	1 (7)	1 (20)
Heredity for cancer	24 (39)	17 (41)	4 (27)	3 (60)